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WEAR AND TEAR,

OR

HINTS FOR THE OVERWORKED.

BY

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SOME two years ago I found occasion to set before the readers of *Lippincott's Magazine* certain thoughts concerning work in America, and its results. Somewhat to my surprise the article attracted more notice than usually falls to the share of such papers, and since then, from numerous sources, I have had the pleasure to learn that my words of warning have been of good service to many thoughtless sinners against the laws of labor and of rest. I have found, also, that the views then set forth as to the peculiar difficulties of mental and physical work in this country are in strict accordance with the personal experience of

foreign scholars who have cast their lots among us; while some of our best teachers have thanked me for stating, from a doctor's standpoint, the evils which their own experience had taught them to see in our present mode of tasking the brains of the younger generation of girls.

I hope, therefore, that I am justified in the belief that in its new and larger form my little tract may again claim attention from such as need its lessons. Since it was meant only for these, I need not excuse myself to physicians for its simplicity; while I trust that certain of my brethren may find in it enough of original thought to justify its reappearance, as its statistics were taken from manuscript notes and have been printed in no scientific journal.

I have called these Hints WEAR and TEAR, because this title clearly and briefly points out my meaning. *Wear* is a natural and legitimate result of lawful use, and is what we all have to put up with as the result of years of activity of brain and body. *Tear* is another matter: it comes of hard or evil usage of body or engine, of putting things to wrong purposes, using a chisel for a screwdriver,

a penknife for a gimlet. Long strain, or the sudden demand of strength from weakness, causes tear. Wear comes of use; tear of abuse.

The sermon of which these words are the text has been preached many times in many ways to congregations for whom the Dollar Devil had always a more winning eloquence. Like many another man who has talked wearily to his fellows with an honest sense of what they truly need, I feel how vain it is to hope for many earnest listeners. Yet here and there may be men and women, ignorantly sinning against the laws by which they should live or should guide the lives of others, who will perhaps be willing to heed what one unbiased thinker has to say in regard to the dangers of the way they are treading with so little knowledge as to where it is leading.

The man who lives an outdoor life—who sleeps with the stars visible above him—who wins his bodily subsistence at first-hand from the earth and waters—is a being who defies rain and sun, has a strange sense of elastic strength, may drink if he likes, and may smoke all day long, and feel none the worse for it. Some such

return to the earth for the means of life is what gives vigor and developing power to the colonists of an older race cast on a land like ours. A few generations of men living in such fashion store up a capital of vitality which accounts largely for the prodigal activity displayed by their descendants, and made possible only by the sturdy contest with Nature which their ancestors have waged. That such a life is still led by multitudes of our countrymen is what alone serves to keep up our pristine force and energy. Are we not merely using the interest on these accumulations of power, but also wastefully spending the capital? From a few we have grown to millions, and already in a multitude of ways the people of the Atlantic coast present the peculiarities of an old nation. Have we lived too fast? The settlers here, as elsewhere, had ample room, and lived sturdily by their own hands, little troubled for the most part with those intense competitions which make it hard to live nowadays and embitter the daily bread of life. Neither had they the thousand intricate problems to solve which perplex those who struggle to-day in our teeming city hives.

Above all, educational wants were limited in kind and in degree, and the physical man and woman were what the growing state most needed.

How much and what kind of good came of the gradual change in all these matters we well enough know. That in one and another way the cruel competition for the dollar, the new and exacting habits of business, the racing speed which the telegraph and railway have introduced into commercial life, the new value which great fortunes have come to possess as means towards social advancement, and the overeducation and overstraining of our young people, have brought about some great and growing evils, is what is now beginning to be distinctly felt. I should like, therefore, at the risk of being tedious, to re-examine this question—to see if it be true that the nervous system of certain classes of Americans is being sorely overtaxed—and to ascertain how much our habits, our modes of work, and, haply, climatic peculiarities, may have to do with this state of things. But before venturing anew upon a subject which may possibly excite controversy and indignant comment, let me premise that I am

talking chiefly of the crowded portions of our country—of our Atlantic States—of our great towns, and especially of their upper classes, and am dealing with those higher questions of mental hygiene of which in general we hear but too little. If the strictures I have to make applied throughout the land—to Oregon as to New England, to the farmer as to the business man, to the women of the artisan class as to those socially above them—then indeed I should cry, God help us and those that are to come after us! Owing to causes which are obvious enough, the physical worker is being better and better paid and less and less hardly tasked, while just the reverse obtains in increasing ratios for those who live by the lower form of brain-work; so that the bribe to use the hand is growing daily, and pure mechanical labor, as opposed to that of the clerk, is being "leveled upward" with a fortunate celerity.

Before attempting to indicate certain ways in which we as a people are overtaxing and misusing the organs of thought, I should be glad to have the privilege of explaining the terms which it is necessary to use, and of pointing out some of

the conditions under which mental labor is performed.

The human body carries on several kinds of manufacture, two of which—the evolution of muscular force or motion, and intellection with all moral activities—alone concern us here. We are somewhat apt to antagonize these two sets of functions, and to look upon the latter, or brain-labor, as alone involving the use or abuse of the nervous system. But every blow on the anvil is as distinctly an act of the nerve centres as are the highest mental processes. If this be so, how or why is it that excessive muscular exertion—I mean such as is violent and continued—does not cause the same appalling effects as may be occasioned by a like abuse of the nerve organs in mental actions of various kinds? This is not an invariable rule, for, as I may point out in the way of illustration hereafter, the centres which originate or evolve muscular power do sometimes suffer from undue taxation; but it is certainly true that when this happens, the evil result is rarely as severe or as lasting as when it is the organs of mental power that have suffered.

In either form of work, physical or mental, the will acts to start the needed processes, and afterward is chiefly regulative. In the case of bodily labor, the spinal nerve centres are most largely called into action. Where mental or moral processes are involved, the active organs lie within the cranium. As I said just now, when we talk of an overtaxed nervous system it is usually the brain we refer to, and not the spine; and the question therefore arises, Why is it that an excess of physical labor is better borne than a like excess of mental labor? The simple answer is, that mental overwork is harder, because as a rule it is closet or counting-room or at least indoor work — sedentary, in a word. The man who is intensely using his brain is not collaterally employing any other organs, and the more intense his application the less locomotive does he become. On the other hand, however a man abuses his powers of motion in the way of work, he is at all events encouraging that collateral functional activity which mental labor discourages: he is quickening the heart, driving the blood through unused channels, hastening the breathing and

increasing the secretions of the skin—all excellent results, and, even if excessive, better than a too incomplete use of these functions.

But there is more than this in the question. We do not know as yet what is the cost in expended material of mental acts as compared with motor manifestations, and here, therefore, are at fault; because, although it seems so much slighter a thing to think a little than to hit out with the power of a Heenan, it may prove that the expenditure of nerve material is in the former case greater than in the latter.

When a man uses his muscles, after a time comes the feeling called fatigue—a sensation always referred to the muscles, and due most probably to the deposit in the tissues of certain substances formed during motor activity. Warned by this weariness, the man takes rest—may indeed be forced to do so; but, unless I am mistaken, he who is intensely using the brain does not feel in the common use of it any sensation referable to the organ itself which warns him that he has taxed it enough. It is apt, like a well-bred creature, to get into a sort of exalted state under the stimulus

of need, so that its owner feels amazed at the ease of its processes and at the sense of *wide-awakefulness* and power that accompanies them. It is only after very long misuse that the brain begins to have means of saying, "I have done enough;" and at this stage the warning comes too often in the shape of some one of the many symptoms which indicate that the organ is already talking with the tongue of disease.

I do not know how these views will be generally received, but I am sure that the personal experience of many scholars will decide them to be correct; and they serve to make clear why it is that men may not know they are abusing the organ of thought until it is already suffering deeply, and also wherefore the mind may not be as ruthlessly overworked as the legs or arms.

Whenever I have closely questioned patients or men of studious habits as to this matter, I have found that most of them, when in health, recognized no such thing as fatigue in mental action, or else I learned that what they took for this was merely that physical sense of being tired, which arises from prolonged writing or constrained posi-

tions. The more, I fancy, any healthy student reflects on this matter the more clearly will he recognize this fact, that very often when his brain is at its clearest, he pauses only because his back is weary, his eyes aching, or his fingers tired.

This most important question, as to how a man shall know when he has sufficiently tasked his brain, demands a longer answer than I can give it here; and, unfortunately, there is no popular book since Ray's clever and useful Mental Hygiene, and Feuchtersleben's Dietetics of the Soul, both out of print, which deals in a readable fashion with this or kindred topics. Many men are warned by some sense of want of clearness or ease in their intellectual processes. Others are checked by a feeling of surfeit or disgust, which they obey or not as they are wise or unwise. Here, for example, is in substance the evidence of a very attentive student of his own mental mechanism, whom we have to thank for many charming products of his brain. Like most scholars, he can scarcely say that he ever has a sense of "brain-tire," because cold hands and feet and a certain restlessness of the muscular system drive him to

take exercise. Especially when working at night, he gets after a time a sense of disgust at the work he is doing. "But sometimes," he adds, "my brain gets going, and is to be stopped by none of the common plans of counting, repeating French verbs, or the like." A well-known poet describes to me the curious condition of excitement into which his brain is cast by the act of composing verse, and thinks that the happy accomplishment of his task is followed by a feeling of relief, which shows that there has been high tension.

One of our ablest medical scholars reports himself to me as having never been aware of any sensation in the head, by which he could tell that he had worked enough, up to a late period of his college career, when, having overtaxed his brain, he was restricted by his advisers to two or three hours of daily study. He thus learned to study hard, and ever since has been accustomed to execute all mental tasks at high pressure under intense strain and among the cares of a great practice. All his mind-work is, however, forced labor, and it always results in a distinct sense of cerebral fatigue,—a feeling of pressure, which is eased by

clasping his hands over his head; and also there is desire to lie down and rest.

"I am not aware," writes a physician of distinction, "that, until a few years ago, I ever felt any sense of fatigue from brain-work which I could refer to the organ employed. The longer I worked the clearer and easier my mental processes seemed to be, until, during a time of great sorrow and anxiety, I pushed my thinking organs rather too hard. As a result, I began to have headache after every period of intellectual exertion. Then I lost power to sleep. Although I have partially recovered, I am now always warned when I have done enough, by lessening ease in my work, and by a sense of fullness and tension in the head." The indications of brain-tire, therefore, differ in different people, and are more and more apt to be referred to the thinking organ as it departs more and more from a condition of health. Surely a fuller record of the conditions under which men of note are using their mental machinery would be every way worthy of attention.

Another reason why too prolonged use of the brain is so mischievous is seen in a peculiarity,

which is of itself a proof of the auto-activity of the vital acts of the various organs concerned in intellection. We sternly concentrate attention on our task, whatever it be; we do this too long, or under circumstances which make labor difficult, such as during digestion or when weighted by anxiety. At last we stop and propose to find rest in bed. Not so, says the ill-used brain, now morbidly wide awake; and whether we will or not, the mind keeps turning over and over the work of the day, the business or legal problem, or mumbling, so to speak, some wearisome question in a fashion made useless by the denial of full attention. Or else the imagination soars away with the unrestful energy of a demon, conjuring up an endless procession of broken images and disconnected thoughts, so that sleep is utterly banished.

I have chosen here as examples men whose brains are engaged constantly in the higher forms of mental labor; but the difficulty of arresting at will the overtasked brain belongs more or less to every man who overuses this organ, and is the well-known initial symptom of numerous morbid

states. I have instanced scholars and men of science chiefly, because they, more than others, are apt to study the conditions under which their thinking organs prosper or falter in their work, and because from them have we had the clearest accounts of this embarrassing condition of automatic activity of the cerebral organs. Few thinkers have failed, I fancy, to suffer in this way at some time, and with many the annoyance is only too common. I do not think the subject has received the attention it deserves, even from such thorough believers in unconscious cerebration as Maudsley. As this state of brain is fatal to sleep, and therefore to needful repose of brain, every sufferer has a remedy which he finds more or less available. This usually consists in some form of effort to throw the thoughts off the track upon which they are moving. I cannot do better than refer the reader for fuller information on this subject to Dr. Wm. A. Hammond's admirable little book on Sleep and its Derangements, in which the whole matter is fully discussed. Almost every literary biography has some instance of this difficulty, and some hint as to the sufferer's

method of freeing his brain from the despotism of a ruling idea or a chain of thought.

Many years ago I heard Mr. Thackeray say that he was sometimes haunted, when his work was over, by the creatures he himself had summoned into being, and that it was a good corrective to turn over the pages of a dictionary. Sir Walter Scott is said to have been troubled in a similar way. A great lawyer, whom I questioned lately as to this matter, told me that his cure was a chapter or two of a novel, with a cold bath before going to bed; for, said he, quaintly, "You never take out of a cold bath the thoughts you take into it." It would be easy to multiply such examples.

Looking broadly at the question of the influence of excessive and prolonged use of the brain upon the health of the nervous system, we learn, first, that cases of cerebral exhaustion in people who live wisely are rare. Eat regularly and exercise freely, and there is scarce a limit to the work you may get out of the thinking organs. But if into the life of a man whose powers are fully taxed we bring the elements of great anxiety or worry,

the whole machinery begins at once to work, as it were, with a dangerous amount of friction. Add to this constant fatigue of body, such as some forms of business bring about, and you have all the means needed to ruin the man's power of useful labor.

I have been careful here to state that combined overwork of mind and body is doubly mischievous, because nothing is now more sure in hygienic science than that a proper alternation of physical and mental labor is best fitted to insure a lifetime of wholesome and vigorous intellectual exertion. This is probably due to several causes, but principally to the fact that during active exertion of the body the brain cannot be employed intensely, and therefore has secured to it a state of repose which even sleep is not always competent to supply. There is a Turkish proverb which occurs to me here, like most proverbs, more or less true: "Dreaming goes afoot, but who can think on horseback?" Perhaps, too, there is concerned a physiological law, which, though somewhat mysterious, I may again have to summon to my aid in the way of explanation. It is known as the law of Trevi-

ranus, its discoverer, and may thus be briefly stated: Each organ is to every other as an excreting organ. In other words, to insure perfect health, every tissue, bone, nerve, tendon, or muscle should take from the blood certain materials and return to it certain others. To do this every organ must or ought to have its period of activity and of rest, so as to keep the vital fluid in a proper state to nourish every other part. This process in perfect health is a system of mutual assurance, and is probably essential to a condition of entire vigor of both mind and body.

It has long been believed that maladies of the nervous system are increasing rapidly in the more crowded portions of the United States; but I am not aware that any one has studied the death-records to make sure of the accuracy of this opinion. There can be no doubt, I think, that the palsy of children becomes more frequent in cities just in proportion to their growth in population. I mention it here, because as it is a disease which does not kill but only cripples, it has no place in the mortuary tables. Neuralgia is another malady which has no record there, but is, I sus-

pect, increasing at a rapid rate wherever our people are crowded together in towns. Perhaps no other form of sickness is so sure an indication of the development of the nervous temperament, or that condition in which there are both feebleness and irritability of the nervous system. But the most unquestionable proof of the increase of nervous disease is to be looked for in the death statistics of cities.

There, if anywhere, we shall find evidence of the fact, because there we find in exaggerated shapes all the evils I have been defining. The best mode of testing the matter is to take the statistics of some large city which has grown from a country town to a vast business hive within a very few years. Chicago fulfills these conditions precisely. In 1852 it numbered 49,407 souls. At the close of 1868 it had reached to 252,054. Within these years it has become the keenest and most wide-awake business centre in America. I owe to the kindness of Dr. J. H. Rauch, Sanitary Superintendent of Chicago, manuscript records, hitherto unpublished, of its deaths from nervous disease, as well as the statement of each year's total mor-

tality; so that I have it in my power to show the increase of deaths from nerve disorders relatively to the annual loss of life from all causes. I possess similar details as to Philadelphia, which seem to admit of the same conclusions as those drawn from the figures I have used. But here the evil has increased more slowly. Let us see what story these figures will tell us for the Western city. Unluckily, they are rather dry tale-tellers.

The honest use of the mortuary statistics of a great town is no easy matter, and I must therefore ask that I may be supposed to have taken every possible precaution in order not to exaggerate the reality of a great evil. Certain diseases, such as apoplexy, palsy, epilepsy, St. Vitus's dance, and lockjaw or tetanus, we all agree to consider as nervous maladies: convulsions, and the vast number of cases known in the death-lists as dropsy of the brain, effusion on the brain, etc., are to be looked upon with more doubt. The former, as every doctor knows, are, in a vast proportion of instances, due to direct disease of the nerve centres; or, if not to this, then to such a condition of irritability of these parts as makes them too

ready to originate spasms in response to causes which disturb the extremities of the nerves, such as teething and the like. This tendency seems to be fostered by the air and habits of great towns, and by all of the agencies which in these places depress the health of a community. The other class of diseases, as dropsy of the brain or effusion, probably includes a number of maladies, due some of them to scrofula, and to the predisposing causes of that disease; others, to the kind of influences which seem to favor convulsive disorders. Less surely than the former class can these be looked upon as true nervous diseases; so that in speaking of them I am careful to make separate mention of their increase, while thinking it right on the whole to include in the general summary of this growth of nerve disorders this partially doubtful class.

Taking the years 1852 to 1868, inclusive, it will be found that the population of Chicago has increased 5·1 times and the deaths from all causes 3·7 times; while the nerve deaths, including the doubtful class labeled in the reports as dropsy of the brain and convulsions, have risen to 20·4

times what they were in 1852. Thus in 1852, '53, and '55, leaving out the cholera year '54, the deaths from nerve disorders were respectively to the whole population as 1 in 1149, 1 in 953, and 1 in 941; whilst in 1866, '67, and '68, they were 1 in 505, 1 in 415·7, and 1 in 287·8. Still omitting 1854, the average proportion of neural deaths to the total mortality was, in the five years beginning with 1852, 1 in 26·1. In the five latter years studied—that is, from 1864 to 1868, inclusive—the proportion was 1 nerve death to every 9·9 of all deaths.

I have alluded above to a class of deaths included in my tables, but containing, no doubt, instances of mortality due to other causes than disease of the nerve organs. Thus many which are stated to have been owing to convulsions ought to be placed to the credit of tubercular disease of the brain or to heart maladies; but even in the practice of medicine the distinction as to cause cannot always be made; and as a large proportion of this loss of life is really owing to brain affections, I have thought best to include the whole class in my statement.

A glance at the individual diseases which are indubitably nervous is more instructive and less perplexing. For example, taking the extreme years, the recent increase in apoplexy is remarkable, even when we remember that it is a malady of middle and later life, and that Chicago, a new city, is therefore entitled to a yearly increasing quantity of this form of death. In 1868 the number was 8·6 times greater than in 1852. Convulsions as a death cause had in 1868 risen to 22 times as many as in the year 1852. Epilepsy, one of the most marked of all nervous maladies, is more free from the difficulties which belong to the last-mentioned class. In 1852 and '53 there were but two deaths from this disease; in the next four years there were none. From 1858 to '64, inclusive, there were in all 6 epileptic deaths: then we have in the following years, 5, 3, 11; and in 1868 the number had increased to 17. Passing over palsy, which, like apoplexy, increases in 1868—8·6 times as compared with 1852, and 26 times as compared with the four years following 1852—we come to lockjaw, an unmistakable nerve malady. Six years out of the

first eleven give us no death from this painful disease: the others, up to 1864, offer each one only, and the last-mentioned year has but two. Then the number rises to 3 each year, to 5 in 1867, and to 12 in 1868. At first sight, this record of mortality from lockjaw would seem to be conclusive, yet it is perhaps, of all the maladies mentioned, the most deceptive as a means of determining the growth of neural diseases. To make this clear to the general reader, he need only be told that tetanus is nearly always caused by mechanical injuries, and that the natural increase of these in a place like Chicago may account for a large part of the increase. Yet, taking the record as a whole, and viewing it only with a calm desire to get at the truth, it is not possible to avoid seeing that the growth of nerve maladies has been inordinate.

The situation of Chicago would alone make it deadly, were it not for the sagacity and enterprise of its present health officers and its bountiful supply of pure water. The industry and energy which have built this great city on a morass, and made it a vast centre of insatiate commerce, are

now at work to undermine the nervous systems of its restless and eager people. With what result, I have here tried to point out, chiefly because it is an illustration in the most concentrated form of causes which are at work throughout the entire land.

The facts I have given establish the disproportionate increase in one great city of those diseases which are largely produced by the strain on the nervous system resulting from the toils and competitions of a community growing rapidly and stimulated to its utmost capacity. Probably the same rule would be found to apply to other large towns, but I have not had time to study the statistics of any of them fully; and for reasons already given, Chicago may be taken as a typical illustration.

If I have made myself understood, we are now prepared to apply some of our knowledge to the solution of certain awkward questions which force themselves daily upon the attention of every thoughtful and observant physician, and have thus opened a way to the discussion of the causes which, as I believe, are deeply affecting the mental

and physical health of working Americans. Some of these are due to the climatic conditions under which all work must be done in this country, some are outgrowths of our modes of labor, and some go back to social habitudes and methods of education.

In studying this subject, it will not answer to look only at the causes of sickness and weakness which affect the male sex. If the mothers of a people are sickly and weak, the sad inheritance falls upon their offspring, and this is why I must deal first, however briefly, with the health of our girls, because it is here, as the doctor well knows, that the trouble begins. Ask any physician of your acquaintance to sum up thoughtfully the young girls he knows, and to tell you how many in each score are fit to be healthy wives and mothers, or in fact to be wives and mothers at all. I have been asked this question myself very often, and I have heard it asked of others. The answers I am not going to give, chiefly because I should not be believed—a disagreeable position, in which I shall not deliberately place myself. Perhaps I ought to add that the replies I have heard given by others were appalling.

Next, I ask you to note carefully the expression and figures of the young girls whom you may chance to meet in your walks, or whom you may observe at a concert or in the ball-room. You will see many very charming faces, the like of which the world cannot match—figures somewhat too spare of flesh, and, especially south of Rhode Island, a marvelous littleness of hand and foot. But look further, and especially among New England young girls: you will be struck with a certain hardness of line in form and feature which should not be seen between thirteen and eighteen, at least; and if you have an eye which rejoices in the tints of health, you will miss them on a multitude of the cheeks we are now so daringly criticising. I do not want to do more than is needed of this ungracious talk: suffice it to say that multitudes of our young girls are merely pretty to look at, or not that—that their destiny is the shawl and the sofa, neuralgia, weak backs, and the varied forms of hysteria—that domestic demon which has produced untold discomfort in many a household, and, I am almost ready to say, as much unhappiness as the husband's dram. My phrase may

seem outrageously strong, but only the doctor knows what one of these self-made invalids can do to make a household wretched. Mrs. Gradgrind is, in fiction, the only successful portrait of this type of misery, of the woman who wears out and destroys generations of nursing relatives, and who, as Wendell Holmes has said, is like a vampire, sucking slowly the blood of every healthy, helpful creature within reach of her demands.

If any reader doubts my statement as to the physical failure of our city-bred women to fulfill all the natural functions of mothers, let him contrast the power of the recently imported Irish or Germans to nurse their babies a full term or longer, with that of the native women even of our mechanic classes. It is difficult to get at full statistics as to those of a higher social degree, but I suspect that not over one-half are competent to nurse their children a full year without themselves suffering gravely. I ought to add that our women, unlike ladies abroad, are usually anxious to nurse their own children, and merely cannot. The numerous artificial infant foods now for sale singularly prove the truth of this latter statement. Many physi-

cians, with whom I have talked of this matter, believe that I do not overstate the evil; others think that two-thirds may be found reliable as nurses; while the rural doctors, who have replied to my queries, state that only from one-tenth to three-tenths of farmers' wives are unequal to this natural demand. There is indeed little doubt that the mass of our women possess that peculiar nervous organization which is associated with great excitability, and, unfortunately, with less physical vigor than is to be found, for example, in the sturdy English dames at whom Hawthorne sneered so bitterly. And what are the causes to which these peculiarities are to be laid? There are many who will say that late hours, styles of dress, prolonged dancing, etc. are to be blamed; while really, with rare exception, the newer fashions have been more healthy than those they superseded, people are better clad and better warmed than ever, and, save in rare cases, late hours and overexertion in the dance are utterly incapable of alone explaining the mischief. I am far more inclined to believe that climatic peculiarities have formed the groundwork of the evil, and enabled every injurious agency to

produce an effect which would not in some other countries be so severe. I am quite persuaded, indeed, that the development of a nervous temperament, with lessened power of endurance, is one of the many race-changes which are also giving us facial, vocal, and other peculiarities derived from none of our ancestral stocks. If, as I believe, this change of temperament in a people coming largely from the phlegmatic races is to be seen most remarkably in the more nervous sex, it will not surprise us that it should be fostered by many causes which are fully within our own control. Given such a tendency, disease will find in it a ready prey, want of exercise will fatally increase it, and all the follies of fashion will aid in the work of ruin.

While a part of the mischief lies with climatic conditions which are utterly mysterious, the obstacles to physical exercise, arising from extremes of temperature, constitute at least one obvious cause of ill health among women in our country. The great heat of summer, and the slush and ice of winter, interfere with women who wish to take exercise, but whose arrangements to go out-of-

doors involve wonderful changes of dress and an amount of preparation appalling to the masculine creature.

Worst of all, however, to my mind—most destructive in every way—is the American view of female education. The time taken for the more serious instruction of girls extends to the age of eighteen, and rarely over this. During these years they are undergoing such organic development as renders them remarkably sensitive. At seventeen I presume that healthy girls are nearly as well able to study, with proper precautions, as men; but before this time over-use, or even a very steady use, of the brain is dangerous to health and to every probability of future womanly usefulness.

In most of our schools the hours are too many, for both girls and boys. From a quarter of nine or nine until half-past two is, with us, the common school-time in private seminaries. The usual recess is twenty minutes or half an hour, and it is not filled by enforced exercise. In certain schools—would it were the rule!—ten minutes recess is given after every hour; and in the Blind Asylum this time is taken up by light

gymnastics, which are obligatory. To these hours we must add the time spent in study out of school. This, for some reason, nearly always exceeds the time stated by teachers to be necessary; and most girls between the ages of thirteen and seventeen thus expend two or three hours. Does any physician believe that it is good for a growing girl to be so occupied seven or eight hours a day? or that it is right for her to use her brains as long a time as the mechanic employs his muscles? But this is only a part of the evil. The multiplicity of studies, the number of teachers,—each eager to get the most he can out of his pupil,—the severer drill of our day, and the greater intensity of application demanded, produce effects on the growing brain which, in a vast number of cases, can be only disastrous.

Even in girls of from fourteen to eighteen, such as crowd the Normal School in Philadelphia, this sort of tension and this variety of study occasion an amount of ill health which is sadly familiar to many physicians. The girls may themselves have no easy escape, as they are in training to teach for a living; but surely it were

possible and reasonable to lessen the useless load they have now to carry. Not to be unfair, let us take Section A, the highest class. It has eighteen branches and twenty-two studies every week, and once in two weeks Composition is added, making twenty-three in all, and this is what the scholars learn: Local Geography, Physical Geography, Grammar, Rhetoric, Arithmetic, Algebra, Constitution of the United States, Elocution, Etymology, Ancient History, Modern History, Penmanship, Drawing, Mensuration, Geometry, Philosophy, Chemistry, Theory and Practice of Teaching. The last three are taught by lectures. There are five recitations a day, but only about three daily studies requiring home preparation; which, says the Controllers' Report, ought not to occupy more than two hours,* but, in a vast number of instances, do really demand very much more than this. Supposing no outside work to be needed for the lectures, we have still eighteen branches to be worked at in five days. The sole relief to this sad catalogue is

* Report of Controllers, 1868.

the statement that the pupils are trained in Physical Exercises.

In private schools the same kind of thing goes on, with the addition of foreign languages, and under the dull spur of discipline, without the aid of any such necessities as stimulate the pupils of what we are pleased to call a normal (!) school.

In New England, where the forcing system is at its wicked worst for both sexes, the evil is beginning to attract attention, as in the case of the Boys' Latin School at Boston, which has no Saturday holiday, and seems to be admirably arranged to destroy health. In the Controllers' Report, whence I cull my facts as to the Normal School of Philadelphia, there is quoted from a New England report a significant passage — whether it applies to girls or boys we do not learn. The health of school children, say the Controllers, in their report, dated 1869, has attracted the attention of the Massachusetts Board of Education, and their last report contains important statistics as to the exhausting effects of over-exertion of the brain: "In one school of eighty-five pupils, only fifty-four had refreshing sleep; fifty-nine had head-

aches or constant weariness, and only fifteen were perfectly well." They next tell us that the best medical opinions state that men should not use the brain daily more than six hours, nor children more than three: "But in the above school thirty-one studied three and one-half hours, thirty-five studied four hours, and twelve from four to seven hours, *in addition to the six hours of school.*" The report adds that, "in places where scholars are highest in reputation, the above example is the common experience."

In a somewhat discursive fashion I have pointed out the mischief which is pressing to-day upon our girls of every class in life. The doctor knows how often and how earnestly he is called upon to remonstrate against this growing evil. He is, of course, well enough aware that many sturdy girls stand the strain, but he knows also that very many do not—and that the brain, sick with multiplied studies never thoroughly mastered, plods on, doing poor work, until somebody wonders what is the matter with that girl; and so she scrambles through, or else breaks down with weak eyes, headaches, neuralgias, or what not.

I am perfectly confident that I shall be told here that girls ought to be able to study hard between fourteen and eighteen years without injury, if boys can do it. Practically, however, the boys of to-day are getting their toughest education later and later in life, while girls leave school at the same age as they did thirty years ago. It used to be common for boys to enter college at fourteen: at present, eighteen is a usual age of admission at Harvard or Yale. Now, let any one compare the scale of studies for both sexes employed half a century ago with that of to-day. He will find that its demands are vastly more exacting than they were—a difference fraught with no evil for men, who attack the graver studies later in life, but most perilous for girls, who are still expected to leave school at eighteen or earlier.*

I firmly believe—and I am not alone in this opinion—that as concerns the physical future of women they would do far better if the brain were

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* Witness Richardson's heroine, who was "perfect mistress of the four rules of arithmetic!"

very lightly tasked and the school-hours but three or four a day until they reach the age of seventeen at least. Anything, indeed, were better than loss of health; and if it be in any case a question of doubt, the school should be unhesitatingly abandoned or its hours lessened, as the source of very many of the nervous maladies with which our women are troubled. I am almost ashamed to defend a position which is held by many competent physicians, but an intelligent friend, who has read this page, still asks me why it is that overwork of brain should be so serious an evil to women at the age of womanly development. My best reply would be the experience and opinions of those of us who are called upon to see how many school-girls are suffering in health from confinement, want of exercise at the time of day when they most incline to it, bad ventilation,* and too

* In the city where this is written there is, so far as I know, not one private girls' school in a building planned for a school-house. As a consequence, we hear endless complaints from young ladies of overheated or chilly rooms. If the teacher be old, the room is kept too warm; or if she be young, and much afoot about her school, the apartment is apt to be cold.

steady occupation of mind. At no other time of life is the nervous system so sensitive—so irritable, I might say—and at no other are abundant fresh air and exercise so all-important. To show more precisely how the growing girl is injured by the causes just mentioned would carry me upon subjects unfit for full discussion in these pages, but no thoughtful reader can be much at a loss as to my meaning.

These, then, are a few of the reasons why it were better not to educate girls at all between the ages of fourteen and eighteen, unless it can be done with careful reference to their bodily health. To-day, the American woman is, to speak plainly, physically unfit for her duties as woman, and is perhaps of all civilized females the least qualified to undertake those weightier tasks which tax so heavily the nervous system of man. She is not fairly up to what nature asks from her as wife and mother. How will she sustain herself under the pressure of those yet more exacting duties which nowadays she is eager to share with the man?

While making these stringent criticisms, I am

anxious not to be misunderstood. The point which above all others I wish to make is this, that owing chiefly to peculiarities of climate, our growing girls are endowed with organizations so highly sensitive and impressionable that we expose them to needless dangers when we attempt to overtax them mentally. In any country the effects of such a course must be evil, but in America, I believe it to be most disastrous.

As I have summoned up climate in the broad sense to account for some peculiarities of the health of our women, so also would I admit it as one of the chief reasons why work among men results so frequently in tear as well as wear. I believe that something in our country makes intellectual work of all kinds harder to do than it is in Europe; and since we do it with a terrible energy, the result shows in wear very soon, and almost always in the way of tear also. Perhaps few persons who look for evidence of this fact at our national career alone will be willing to admit my proposition, but among the higher intellectual workers, such as astronomers, physicists and naturalists, I have frequently heard this belief

expressed, and by none so positively as those who have lived on both continents. Since this paper was first written I have been at some pains to learn directly from Europeans who have come to reside in America how this question has been answered by their experience. For obvious reasons, I do not name my witnesses, who are numerous; but, although they vary somewhat in the proportion of the effects which they ascribe to climate and to such domestic peculiarities as the overheating of our houses, they are at one as regards the simple fact that, for some reason, mental work is more exhausting here than in Europe; while, as a rule, such Americans as have worked abroad are well aware that in France and in England intellectual labor is less trying than it is with us. A great physiologist, well known among us, long ago expressed to me the same opinion; and one of the greatest of living naturalists, who is honored alike on both continents, is positive that brain-work is harder and more hurtful here than abroad — an opinion which is shared by Oliver Wendell Holmes and other competent observers. Certain it is that

our thinkers of the classes named are apt to break down with what the doctor knows as cerebral exhaustion, — a condition in which the mental organs become more or less completely incapacitated for labor, — and that this state of things is very much less common among the savans of Europe. A share in the production of this evil may perhaps be due to certain general habits of life which fall with equal weight of mischief upon many classes of busy men, as I shall presently point out. Still, these will not altogether account for the fact, nor is it to my mind quite fully explained by any of the more obvious faults in our climate, nor yet by our habits of life, such as furnace-warmed houses, hasty meals, bad cooking, or neglect of exercise. Let a man live as he may, I believe he will still discover that mental labor is with us more exhausting than we could wish it to be. Why this is I cannot say, but it is not more mysterious than the fact that agents which, as sedatives or excitants, affect the great nerve centres, do this very differently in different climates. There is some evidence to show that this is also the case with narcotics; and perhaps a

partial explanation may be found in the manner in which the excretions are controlled by external temperatures, as well as by the fact which Dr. Brown-Séquard discovered, and which I have frequently corroborated, that many poisons are retarded in their action by placing the animal affected in a warm atmosphere.

It is possible to drink with safety in England quantities of wine which here would be disagreeable in their first effect and perilous in their ultimate results. The Cuban who takes coffee enormously at home, and smokes endlessly, can do here neither the one nor the other to the same degree. And so also the amount of excitation from work which the brain will bear varies exceedingly with variations of climatic influences.

We are all of us familiar with the fact that physical work is more or less exhausting in different climates, and as I am dealing, or about to deal, with the work of business men, which involves a certain share of corporeal exertion, as well as with that of mere scholars, I must ask leave to digress, in order to show that in this part of the country at least the work of the body probably

occasions more strain than in Europe, and is followed by greater sense of fatigue.

The question is certainly a large one, and should include a consideration of matters connected with food and stimulants, on which I can but touch. I have carefully questioned a number of master mechanics who employ both foreigners and native Americans, and I am assured that the British workman finds labor more trying here than at home; while, perhaps, the eight-hour movement may be looked upon as an instinctive expression of the main fact as regards our working class in general.

A distinguished English scholar informs me that since he has resided among us the same complaints, as to the depressing effects of physical labor in America, have come to him from skilled English mechanics. What share change of diet and the like may have in the matter, I have not space to discuss.*

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* The new emigrant suffers in a high degree from the same evils as to cookery which affect only less severely the mass of our people, and this, no doubt, helps to enfeeble him. The frying-pan has, I fear, a better right to be called our national emblem than the eagle, and I grieve to say it reigns supreme west of the

Although, from what I have seen, I should judge that overtasked men of science are especially liable to the trouble which I have called cerebral exhaustion, all classes of men who use the brain severely, and who have also—and this is important—seasons of excessive anxiety or of grave responsibility, are subject to the same form of disease; and this is why, I presume, that I, as well as others who are accustomed to encounter nervous disorders, have met with numerous instances of nervous exhaustion among merchants and manufacturers. The lawyer and clergyman offer examples, but I do not remember ever to have seen a bad case among physicians. Dismissing the easy jest which the latter statement will surely suggest, the reason for this we may presently encounter.

My note-books seem to show that manufacturers and certain classes of railway officials are the most liable to suffer from neural exhaustion. Next to

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Alleghanies. I well remember that a party of friends about to camp out were unable to buy a gridiron in two Western towns, each numbering over four thousand eaters of fried meats.

these come merchants in general, brokers, etc.; then less frequently clergymen; still less often lawyers; and more rarely doctors; while distressing cases are apt to occur among the over-schooled young of both sexes.

The worst instances to be met with are among young men suddenly cast into business positions involving weighty responsibility. I can recall several cases of men under or just over twenty-one who have lost health while attempting to carry the responsibilities of great manufactories. Excited and stimulated by the pride of such a charge, they have worked with a certain exaltation of brain, and, achieving success, have been stricken down in the moment of triumph. This too frequent practice of immature men going into business, especially with borrowed capital, is a serious evil. The same person, gradually trained to naturally and slowly increasing burdens, would have been sure of healthy success. In individual cases I have found it so often vain to remonstrate or to point out the various habits which collectively act for mischief on our business class that I may well despair of doing good by a mere general state-

ment. As I have noted them, connected with cases of overwork, they are these: Late hours of work, irregular meals bolted in haste away from home, the want of holidays and of pursuits outside of business, and the consequent practice of carrying home, as the only subject of talk, the cares and successes of the counting-house and the stock-board. Most of these evil habits require no comment. What indeed can be said? The man who has worked hard all day, and lunched or dined hastily, comes home or goes to the club to converse—save the mark!—about goods and stocks. Holidays, except in summer, he knows not, and it is then thought time enough taken from work if the man sleeps in the country and comes into a hot city daily, or at the best has a week or two at the seashore. This incessant monotony tells in the end. Men have confessed to me that for twenty years they had worked every day, often traveling at night or on Sundays to save time; and that in all this period they had not taken one day for play. These are extreme instances, but they are also in a measure representative of a frightfully general social evil.

Is it any wonder if asylums for the insane gape for such men? There comes to them at last a season of business embarrassment; or, when they get to be fifty or thereabouts, the brain begins to feel the strain, and just as they are thinking, "Now we will stop and enjoy ourselves," the brain, which, slave-like, never murmurs until it breaks out into open insurrection, suddenly refuses to work, and the mischief is done. There are therefore two periods of existence especially prone to those troubles—one when the mind is maturing; another at the turning-point of life, when the brain has attained its fullest power, and has left behind it accomplished the larger part of its best enterprise and most active labor.

I am disposed to think that the variety of work done by lawyers, their long summer holiday, their more general cultivation, their usual tastes for literary or other objects out of their business walks, may, to some extent, save them, as well as the fact that they can rarely be subject to the sudden and fearful responsibilities of business men. Moreover, like the doctor, the lawyer gets his weight upon him slowly, and is thirty at least before it can be

heavy enough to task him severely. The business man's only limitation is need of money, and few young mercantile men will hesitate to enter trade on their own account if they can command capital. With the doctor, as with the lawyer, a long intellectual education, a slowly-increasing strain, and responsibilities of gradual growth tend, with his outdoor life, to save him from the form of disease I have been alluding to. This element of open-air life, I suspect, has a large share in protecting men who in many respects lead a most unhealthy existence. The doctor, who is supposed to get a large share of exercise, in reality gets very little after he grows too busy to walk, and has then only the incidental exposure to out-of-door air. When this is associated with a fair share of physical exertion, it is an immense safeguard against the ills of anxiety and too much brain-work. I presume that very few of our generals could have gone through with their terrible task if it had not been that they lived in the open air and exercised freely. For these reasons I do not doubt that the effects of our great contest were far more severely felt by the Secretary of

War and the late President, than by Grant or Sherman.

The wearing, incessant cares of overwork, of business anxiety, and the like, produce directly diseases of the nervous system, and are also the fertile parents of dyspepsia, consumption, and maladies of the heart. How often we can trace all the forms of the first-named protean disease to such causes is only too well known to every physician, and their connection with cardiac troubles is also well understood. Happily, functional troubles of heart or stomach are far from unfrequent precursors of the graver mischief which finally falls upon the nerve centres, if the lighter warnings have been neglected; and for this reason no man who has to use his brain energetically and for long periods, can afford to disregard the hints which he gets from attacks of palpitation of heart or from a disordered stomach. In many instances these are the only expressions of the fact that he is abusing the machinery of mind or body; and the sufferer may think himself fortunate that this is the case, since even the least serious degrees of direct exhaustion of the centres with which he

feels and thinks are more grave and are less open to ready relief.

When affections of the outlying organs are neglected, and even in many cases where these have not suffered at all, we are apt to witness, as a result of too prolonged anxiety combined with business cares, or even of mere overwork alone, with want of proper physical habits as to exercise, amusement, and diet, that form of disorder of which I have already spoken as cerebral exhaustion; and before closing this paper I am tempted to describe briefly the symptoms which warn of its approach or tell of its complete possession of the unhappy victim. Why it should be so difficult of relief is hard to comprehend, until we remember that the brain is apt to go on doing its weary work automatically and despite the will of the unlucky owner; so that it gets no thorough rest, and is in the hapless position of a broken limb which is expected to knit while still in use. Where physical overwork has worn out the spinal or motor centres, it is, on the other hand, easy to enforce repose, and so to place them in the best condition for repair. This was often and happily illustrated

during the war. Severe marches, bad food, and other causes which make war exhausting, were constantly in action, until certain men were doing their work with too small a margin of reserve-power. Then came such a crisis as the last days of McClellan's retreat to the James River, or the forced march of the Sixth Army Corps to Gettysburg, and at once these men succumbed with palsy of the legs. A few months of absolute rest, good diet, ale, fresh beef and vegetables restored them anew to perfect health.

In all probability incessant use of a part flushes with blood the nerve centres which furnish it with motor energy, so that excessive work may bring about a state of congestion, owing to which the nerve centre becomes badly nourished, and at last strikes work. In civil life we sometimes meet with such cases among certain classes of artisans: paralysis of the legs as a result of using the treadle of the sewing-machine ten hours a day is a good example, and, I am sorry to add, not a very rare one, among the overtasked women who slave at such labor.

Now let us see what happens when the intellect-

ual organs are put over-long on the stretch, and when moral causes, such as heavy responsibilities and over-anxiety, are at work.

When in active use, the thinking organs become full of blood, and, as Dr. Lombard has shown, rise in temperature, while the feet and hands become cold. Nature meant that, for their work, they should be, in the first place, supplied with food; next, that they should have certain intervals of rest to rid themselves of the excess of blood accumulated during their periods of activity, and this is to be done by sleep, and also by bringing into play the physical machinery of the body, such as the muscles —that is to say, by exercise which flushes the parts engaged in it and so depletes the brain. She meant, also, that the various brain-organs should aid in the relief, by being used in other directions than mere thought; and lastly, she desired that, during digestion, all the surplus blood of the body should go to the stomach, intestines, and liver, and that neither blood nor nerve-power should be then misdirected upon the brain; in other words, she did not mean that we should

try to carry on, with equal energy, two kinds of important functional business at once.

If, then, the brain-user wishes to be healthy he must limit his hours of work according to rules which will come of experience, and which no man can lay down for him. Above all, let him eat regularly and not at too long intervals. I well remember the amazement of a distinguished naturalist when told that his sleeplessness and irregular pulse were due to his fasting from nine until six. A biscuit and a glass of porter, at one o'clock, effected a ready and pleasant cure. As to exercise in the fresh air, I need say little, except that if the exercise can be made to have a distinct object, not in the way of business, so much the better. Nor should I need to add that we may relieve the thinking and worrying mechanisms by light reading and other amusements, or enforce the lesson that no hard work should be attempted during digestion. The wise doctor may haply smile at the commonplace of such directions, but woe be to the man who neglects them!

When an overworked and worried victim has

sufficiently sinned against these simple laws, if he does not luckily suffer from disturbances of heart or stomach, he begins to have certain signs of nervous exhaustion.

As a rule, one of two symptoms appears first, though sometimes both come together. Work gets to be a little less facile; this astonishes the subject, especially if he has been under high pressure and doing his tasks with that ease which comes of excitement. With this, or a little later, he discovers that he sleeps badly, and that the thoughts of the day infest his dreams, or so possess him as to make slumber difficult. Unrefreshed, he rises and plunges anew into the labor for which he is no longer competent. Let him stop here; he has had his warning. Day after day the work grows more trying, but the varied stimulants to exertion come into play, the mind, aroused, forgets in the cares of the day the weariness of the night season; and so, with lessening power and growing burden, he pursues his purpose. At last come certain new symptoms, such as giddiness, dimness of sight, neuralgia of the face or scalp, with entire nights of insomnia and

growing difficulty in the use of the mental powers; so that to attempt a calculation, or any form of intellectual labor, is to insure a sense of distress in the head, or such absolute pain as proves how deeply the organs concerned have suffered. Even to read is sometimes almost impossible; and there still remains a delusion arising from the fact that under enough of moral stimulus the man may be able, for a few hours, to plunge into business cares, without such pain as completely to incapacitate him for immediate activity. Without fail, however, night brings the punishment; and at last the slightest exertion of mind becomes impossible. In the worst cases the scalp itself grows sore, and a sudden jar hurts the brain, or seems to do so, while the mere act of stepping from a curbstone produces positive pain.

Strange as it may seem, all of this may happen to a man, and he may still struggle onward, ignorant of the terrible demands he is making upon an exhausted brain. Usually, by this time he has sought advice, and, if his doctor be worthy of the title, has learned that while there are certain aids for his symptoms in the shape of drugs, there is

only one real remedy. Happy he if not too late in discovering that complete and prolonged cessation from work is the one thing needful. Not a week of holiday, or a month, but probably a year or more of utter idleness may be absolutely essential. Only this will answer in cases so extreme as that I have tried to depict, and even this will not always insure a return to a state of active working health.

Somewhat distracted by the desire to be brief, and yet to tell the whole story, I have sought, in what I fear is a most loose and disconnected way, to put in a new light some of the evils which are hurting the mothers of our race, and those which every day's experience teaches the doctor are gravely affecting the working capacity of numberless men. I trust I have succeeded in satisfying my readers that we dwell in a climate where work of all kinds demands greater precautions as to health than is the case abroad. We cannot improve our climate, but it is quite possible that we have not sufficiently learned to modify the conditions of labor in accordance with those of the sky under which we live.

No student of the nervous maladies of American men and women will think I have overdrawn any part of the foregoing sketch. It would have been as easy to tell the story of youth, vigorous, eager, making haste to be rich, wrecked and made unproductive and dependent for years or forever; of middle age, unable or unwilling to pause in the career of dollar-getting, crushed to earth in the hour of fruition, or made powerless to labor longer at any cost for those who were dearest.